

THAT WHICH IS CLAIMED IS:

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1. A device for detecting the pressure exerted at different points of a flexible and/or pliable object that may assume different shapes, comprising a plurality of capacitive pressure sensors and at least a system for biasing and reading the capacitance of the sensors, characterized in that said capacitive pressure sensors are constituted by two orthogonal sets of parallel or substantially parallel electrodes spaced, at least at each crossing between an electrode of one set and an electrode of the other set, by an elastically compressible dielectric, constituting an array of pressure sensing pixel capacitors; said system for biasing and reading the capacitance comprising column plate electrode selection circuits and row plate electrode selection circuits and a logic circuit for sequentially scanning said pixel capacitors and outputting pixel values of the pressure for reconstructing a distribution map of the pressure over the area of said array.

2. The device of claim 1, characterized in that each of said two orthogonal sets of parallel electrodes is realized in form of a fabric constituted by weft oriented threads of dielectric material and warp oriented threads alternately of a conducting material, and of a dielectric material or viceversa, said threads of conducting material constituting said parallel electrodes of the set, two fabrics being fastened onto opposite faces of an elastically compressible layer of a dielectric material.

3. The device of claim 1, characterized in that each of said two orthogonal sets of parallel electrodes is realized in form of parallel stripes of conductive paint applied onto a respective face of a dielectric layer or multilayer comprising at least an elastically compressible layer.

4. The device of claim 1, characterized in that each of said two orthogonal sets of parallel electrodes, is constituted by a plurality of stripes of adhesive tape incorporating a thread or ribbon of conductive material laid the surface of said flexible and/or pliable object; the other set of electrodes being laid over the first set of electrodes interposing in each crossing zone between an electrode of one set and an electrode of the other set an elastically compressible dielectric pad.

5. The device of claim 4, characterized in that each of said dielectric pads has a metal coating on both faces contacted by said thread or ribbon of conductive material of the respective adhesive tape of one or of the other set of electrodes.

6. The device according to claim 4 or 5, characterized in that said elastically compressible dielectric pad is a gas filled cushion, the opposite faces of which elastically swell or shrink depending on the pressure difference between the filling gas of the cushion and the outside air.

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7. The device according to claim 4, 5, or 6, characterized in that the flexible and pliable object is a sail and said sets of column plate electrodes and row plate electrodes spaced at crossings
5 by said elastically compressible dielectric forming said array of pressure sensing pixel capacitors are present on both faces of the sail.

8. A bidimensional pressure sensor for producing pictures of the distribution map of the pressure over a surface of a flexible and/or pliable object capable of assuming different shapes, comprises
5 two orthogonal sets of parallel or almost parallel electrodes spaced, at least in correspondence of the crossing zones between electrodes belonging to one set and electrodes belonging to the other set, by an elastically compressible dielectric, constituting an
10 array of pressure sensing pixel capacitors, readable by sequentially scanning the pixels of the crossing zones of a selected column plate electrode of one set with a selected row plate electrode of the other set.

9. The bidimensional pressure sensor of claim 8, characterized in that each of said two orthogonal sets of parallel electrodes is realized in form of a fabric constituted by weft oriented threads
5 of dielectric material and warp oriented threads alternately of a conducting material, and of a dielectric material or viceversa, said threads of conducting material constituting said parallel electrodes of the set, two fabrics being fastened onto
10 opposite faces of an elastically compressible layer of

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a dielectric material.

10. The bidimensional pressure sensor of claim 8, characterized in that each of said two orthogonal sets of parallel electrodes is realized in form of parallel stripes of conductive paint applied
5 onto a respective face of a dielectric layer or multilayer comprising at least an elastically compressible layer.

11. The bidimensional pressure sensor of claim 8, characterized in that each of said two orthogonal sets of parallel or almost parallel electrodes, is constituted by a plurality of stripes of
5 adhesive tape incorporating a thread or ribbon of conductive material laid the surface of said flexible and/or pliable object; the other set of electrodes being laid over the first set of electrodes interposing
10 in each crossing zone between an electrode of one set and an electrode of the other set an elastically compressible dielectric pad.

12. The bidimensional pressure sensor of claim 11, characterized in that each of said dielectric pads has a metal coating on both faces contacted by said thread or ribbon of conductive material of the
5 respective adhesive tape of one or of the other set of electrodes.

13. The bidimensional pressure sensor of claim 11 or 12, characterized in that said elastically compressible dielectric pad is a gas filled cushion,

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the opposite faces of which elastically swell or shrink
5 depending on the pressure difference between the
filling gas of the cushion and the outside air.

14. A method of trimming a sail for
maximizing the net pressure acting onto the windward
face of the sail based on instrumentally measuring the
pressure, characterized in that the pressure and its
5 distribution map over the sail surface is monitored by
producing in a real time mode pictures of the
distribution map and of the value of the pressure over
the whole or a significant portion of the sail surface
on a graphic display monitor, reconstructed from data
10 of pressure measurements carried out by scanning pixel
by pixel an array of pressure sensing pixel capacitors
realized on the surface of sail according to one of
claims 5, 6 and 7.

15. The method of claim 14, characterized in
that an array of pressure sensing pixel capacitors is
realized on both faces of the sail for producing
pictures of the distribution map of the differential
5 pressure of the air on the windward and on the leeward
face of the sail.

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